1998

EC98-789 Farm*A*Syst Nebraska's System for Assessing Water Contamination Fact Sheet 14: Improving Crop Nutrient Application Management

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University of Nebraska Cooperative Extension EC 98-789-S

Farm•A•Syst

FACT SHEET 14

Nebraska's Farm Assessment System for Assessing the Risk of Water Contamination

Improving Crop Nutrient Application Management

Economics, energy and the environment are three primary reasons to be concerned about nutrient management, especially nitrogen (N) management. Nitrogen ranks high on a list of sixteen nutrients needed for the health of most plants, but unfortunately it also ranks high as a contaminant of Nebraska's surface and groundwater. Most other nutrients occur naturally in the soil. Besides nitrogen, phosphorus and potassium are the nutrients most often added to Nebraska soils.

The following University of Nebraska Cooperative Extension publications will help you understand how you might improve your nutrient application management.

Improving Groundwater Quality

- *The Impact of Nitrogen and Irrigation Management and Vadose Zone Conditions on Ground Water Contamination by Nitrate-Nitrogen (EC91-735)*
  How nitrate-nitrogen can become a major source of groundwater contamination when leached from the crop root zone. The time delay between the leaching of nitrate from the crop root zone and its entry into the groundwater can vary from a few weeks to over 30 years, depending on N and irrigation management and vadose zone conditions. Improved N and irrigation management can decrease present and future aquifer contamination rates.
- *Managing Irrigation and Nitrogen to Protect Water Quality (EC 98-786)*
  Nonpoint source contamination of groundwater by nitrate-nitrogen is a growing problem across Nebraska. This publication outlines what producers need to know to help reduce nonpoint source nitrogen contamination, while continuing to farm for a profit.

Basic Soil Physical and Chemical Properties

- *How Soil Holds Water (G90-964)*
  The physical characteristics that influence how soil holds water.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture.
Elbert C. Dickey, Interim Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.

Understanding Plants — Evapotranspiration and Nitrogen

- *Evapotranspiration (ET) or Crop Water Use (G90-992)*
  Crop water use and factors that determine daily and seasonal ET. Estimating ET using weather data is described.

Managing Water

- *Precipitation and Sprinkler Irrigation Monitoring for Managing Irrigation Scheduling (NF91-39)*
  How to determine precipitation and irrigation amounts so that they can be used to help make effective irrigation scheduling decisions.
- *Estimating Effective Rainfall (G92-1099)*
  How irrigators can estimate effective rainfall and use that estimate to schedule irrigations properly.
- *Estimating Soil Moisture by Appearance and Feel (G84-690)*
  A guide for estimating the soil moisture content of a soil sample. Photo and narrative descriptions are given for three different soil textures.
- *Water Measurement Calculations (G78-393)*
  The importance of water measurement for effective irrigation management. Irrigators can use one of several methods to measure water. To take advantage of water measurement data, a knowledge of water measurement calculations is important.
- *Irrigation Scheduling Using Crop Water Use Data (G85-753)*
  Using the "checkbook" method to schedule irrigations based on crop water use data.
- *Irrigation Scheduling Using Soil Moisture Blocks in Silty Soils (EC89-723)*
  How to use soil moisture blocks to schedule irrigations on fine-textured soils.
- *Irrigation Scheduling Using Tensiometers in Sandy Soils (EC89-724)*
  How to use tensiometers to schedule irrigations on fine sands to fine sandy loams.
- *Predicting the Last Irrigation for Corn, Grain Sorghum and Soybeans (G82-602)*
  Criteria and "rules of thumb" for predicting the last irrigation for corn, grain sorghum and soybeans.

Managing Nitrogen

- *Identification of Soil Compaction and Its Limitations to Root Growth (G87-831)*
  How to identify soil compaction and determine if compaction is limiting yield.
- *Fertilizer Suggestions for Corn (G74-174, Rev. 7/95)*
  How fertilizer nutrient requirements for corn are based on expected yield and nutrient levels in the soil.
- *Using Starter Fertilizers for Corn, Grain Sorghum, and Soybeans (G77-361, Rev. 12/90)*
  How starter fertilizer may increase early growth of corn and grain sorghum. Grain yield increases from starter nutrients are most likely on low phosphorus soils and some sandy soils.
- *Fertilizer Suggestions for Soybeans (G87-859)*
  How to determine and apply fertilizer for soybeans. It discusses lime, nitrogen, phosphorus, potassium, and micronutrient needs.
- *Fertilizer Management for Conservation Tillage (EC96-144)*
  The use of fertilizers under reduced tillage with special emphasis on corn production practices.
- *Estimating Manure Nutrients from Livestock and Poultry (G97-1334)*
  Procedures for estimating the quantity of nutrients in livestock manure.
- *Determining Crop Available Nutrients from Manure (G97-1335)*
  The availability and utilization of manure nutrients for field crop production.
- *Calibrating Anhydrous Ammonia Applicators (EC94-737)*
  Why NH3 is so difficult to apply accurately, describes how to identify applicator problems, and presents a method for calibrating anhydrous ammonia application equipment.

- *Using a Chlorophyll Meter to Improve N Management (G93-1171)*
  How to use a chlorophyll meter as a tool to improve nitrogen management by detecting nitrogen deficiency and determining the need for additional N fertilizer.

- *Nitrogen Rate Slide Chart (EC97-147)*
  This chart will help you develop a nitrogen recommendation using the information found in NebGuide G74-174, *Fertilization Suggestions for Corn*.

Managing Phosphorus and Potassium

- *Using Phosphorus Fertilizers Effectively (G82-601)*
  The most effective use of phosphorus, including placing the fertilizer to ensure quick contact by growing roots and minimizing contact with the soil.

- *Use and Management of Micronutrient Fertilizers in Nebraska (G82-596)*
  The use and management of zinc, iron, manganese, copper, boron, molybdenum, and chlorine, essential for plant growth.

All of these publications are available from your local University of Nebraska Cooperative Extension office or directly from IANR Communications and Information Technology, 105 Ag Communications Building, P.O. Box 830918, University of Nebraska, Lincoln, Nebraska 68583-0918, (402) 472-9712. There may be charges for the publications, postage and sales tax.

Most of them are also available on the Web at http://www.ianr.unl.edu/pubs/

Partial funding for materials, adaptation, and development was provided by the U.S. EPA, Region VII (Pollution Prevention Incentives for States and Nonpoint Source Programs) and USDA (Central Blue Valley HUA). This project was coordinated at the Department of Biological Systems Engineering, Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

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Technical reviews were provided by James Peterson and Andrew Christiansen, Extension Educators. The views expressed in this publication are those of the author and do not necessarily reflect the views of either the technical reviewers or the agencies they represent.

Adapted for Nebraska from material prepared for the Wisconsin and Minnesota Farm*A*Syst programs.

Printed on recycled paper.